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Development of Repellents and Other Techniques for Managing Blackbird Depredations to Rice

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National Wildlife Research Center Scientists Address Blackbird Damage to Rice

Wildlife Services' (WS) National Wildlife Research Center (NWRC) is the only Federal research facility devoted exclusively to resolving conflicts between people and wildlife through the development of effective, selective, and acceptable methods, tools, and techniques.

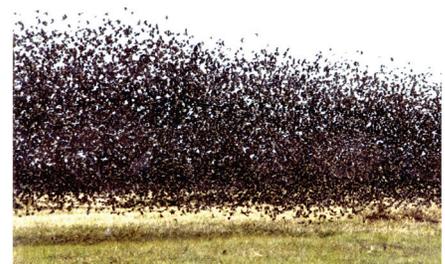
Major Research Accomplishments:

- WS completed a rice producer survey of blackbird damage to rice in Louisiana, Arkansas, Missouri, California and Texas.
- WS evaluated the efficacy of Aza-Direct, GG-orange terpene, caffeine, GWN-4770, GWN 4140 and Tilt® EC as potential blackbird repellents for use on rice seed and ripening rice to reduce blackbird damage.
- WS evaluated alternative baiting strategies for the effective and safe delivery of DRC-1339, an avicide for the control of depredating blackbird populations.
- WS determined DRC-1339 dietary effects on several species of non-target birds.
- WS determined blackbird response to several concentrations of DRC-1339.
- WS determined residue levels of DRC-1339 in soil and plants.
- WS determined the potential hazards of DRC-1339 to non-target bird species.
- WS developed and validated an empirical model to estimate the take of target birds from WS' blackbird/DRC-1339 baiting program in Louisiana, Missouri, and Texas.
- WS determined the movements and distribution of blackbird populations causing damage to rice crops in Missouri, Arkansas and Louisiana.

Red-winged blackbirds, common grackles, and brown-headed cowbirds cause an estimated \$13.4 million worth of damage to newly planted and ripening rice in Arkansas, California, Louisiana, Missouri, and Texas. Some individual growers report 100 percent losses due to bird depredation. NWRC scientists routinely work with rice producers, rice commodity groups, rice research boards, universities, and local, State and Federal agencies to develop safer and more effective methods to reduce bird depredation on seeded and ripening rice and improve profitability for growers. To develop new methods and tools, NWRC scientists conduct multifaceted research studies involving the use of both captive and free-ranging birds to determine the status of blackbird populations in the southern rice-growing states, estimate the economic impacts of birds on the rice crop, evaluate and develop nonlethal repellents for deterring birds, and improve the effectiveness and safety of avicides for reducing depredating populations.

Applying Science and Expertise to Wildlife Challenges

Chemical Repellents—NWRC scientists conducted a series of laboratory and field tests to identify, formulate, and evaluate potential nonlethal repellents for reducing bird damage to newly-planted and ripening rice. Of many chemicals tested, GWN-4770, GWN-4140, caffeine, and Tilt® EC have shown the most promising results. Development and registration of a chemical repellent for seeded or headed rice could have a major



impact on reducing damage losses and environmental hazards and increasing efficiency and profitability of production.

DRC-1339 Baiting—DRC-1339 is an avicide used in the management of blackbirds and starlings on staging areas prior to rice planting. To support the registration of this management tool and improve current baiting methodologies, NWRC scientists conducted tests with caged blackbirds to identify DRC-1339 dose-response curves and determine dietary toxicity of DRC-1339. They also evaluated non-target hazards of DRC-1339 in Louisiana, Missouri and Texas and completed a DRC-1339 confined rotational crop study. This and other studies indicate that hazards to non-target birds are minimal during DRC-1339 baiting operations. Research continues on developing new and improved DRC-1339 bait formulations and delivery methods that improve baiting effectiveness and comply with regulatory issues.

Use of Day-Glo® Fluorescent Marker to Monitor Blackbirds—NWRC scientists used a Day-glo paint pigment to aerially mass-mark more than 3.2 million blackbirds causing damage to rice in Missouri. Three different rice-field roosts containing from 700,000 to 2.2 million birds were sprayed

with different Day-glo colors on consecutive nights. Birds subsequently were collected during January and February 2006 in various rice-producing counties in Louisiana, Arkansas, and Missouri to determine the regional and migratory movements of birds after the rice-growing season. Ten percent of 3,282 blackbirds collected were marked. Collec-

tions continued during the following spring to determine the distribution of breeding male red-winged blackbirds in respect to the marking sites. This technique shows promise as an effective way of determining blackbird roost turnover, roost interchange, movement patterns, and distribution.

Selected Publications:

Avery, M. L., S. J. Werner, J. L. Cummings, J. S. Humphrey, M. P. Milleson, J. C. Carlson, T. M. Primus; M. J. Goodall. 2005. Caffeine for reducing bird damage to newly seeded rice. *Crop Protection* 24:651-657.

Cummings, J. L.; S. A. Shwiff; S. K. Tupper. 2005. Economic impacts of blackbirds on the rice industry. In: Nolte, D.L.; Fagerstone, K.A.; eds. *Proceedings of the 11th Wildlife Damage Management Conference*. 16-19 May 2005; Traverse City, MI. The Wildlife Damage Management Working Group of the Wildlife Society: 317-322.

Groups Affected By This Problem:

- Rice producers
- Consumers of rice products
- Processors, manufacturers, suppliers and sellers of rice products
- Other crop farmers

Major Cooperators:

- Louisiana Rice Research Board
- Louisiana Rice Producers Association
- Louisiana Blackbird Committee
- USA Rice Federation
- Louisiana Rice Research Station (LSU)
- Delta Research Station (MU)
- Missouri Rice Research and Merchandising Council
- Gowan Company
- Syngenta Crop Protection